

REMARKS

By this Amendment, Applicants have amended claim 7 to more appropriately define the invention and have added new claims 21 and 22 to protect additional aspects of the invention. Applicants have also canceled claims 1-3, 6, and 12-13, without prejudice or disclaimer of the subject matter thereof. Claims 4-5, 7-11, and 14-22 are pending.

In the Office Action, the Examiner rejected claims 7 and 8 under 35 U.S.C. § 112, second paragraph, as being indefinite, and rejected claims 1, 2, 5, 12, 15, 17, and 20 under 35 U.S.C. § 102(b) as anticipated by Moriyama et al. (JP 2002-083884, submitted in an IDS by Applicants on July 3, 2003). Claims 4, 9, 10, 11, 14, 16, 18, and 19 were allowed. Claims 3 and 13 were objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants appreciate the indication of allowable subject matter. Applicants submit that new claim 21 is also allowable at least because of its dependence from allowable claim 4.

Applicants submit that the amendment to claim 7 should overcome the rejection of claims 7-8 under 35 U.S.C. § 112, second paragraph, and therefore request that the Examiner withdraw that rejection. The rejection of claims 1, 2, and 12, and the objection to claims 3 and 13 are rendered moot in view of the cancellation of these claims.

Applicants respectfully traverse the rejection of claims 5, 15, 17, and 20 under 35 U.S.C. § 102(b), because Moriyama et al. fails to teach each and every element of these claims.

First, Moriyama et al. fails to teach each and every element of claim 5, which recites a semiconductor memory including, inter alia, “a plurality of first trenches . . . ; a plurality of isolating fillers filled in said first trenches; [and] a plurality of second trenches formed in said isolating fillers, . . . said second trenches being in the shape of a U.” Particularly, the Examiner considered Moriyama et al.’s elements 110 as corresponding to Applicants’ claimed first trenches. Office Action, page 4. However, Moriyama et al. does not disclose isolation fillers in elements 110, in which a trench having the shape of a U is formed. See Moriyama et al., Figs. 18-21. Therefore, Moriyama et al. fails to teach at least “a plurality of second trenches formed in said isolating fillers, . . . said second trenches being in the shape of a U,” as recited in claim 5. Thus, claim 5 is allowable over Moriyama et al., and new claim 22, which depends from claim 5, is also allowable over Moriyama et al. at least because of its dependence from allowable claim 5.

Because Moriyama et al. fails to teach at least “a plurality of second trenches formed in said isolating fillers, . . . said second trenches being in the shape of a U,” as recited in claim 5, Moriyama et al. also fails to teach at least “making a plurality of second trenches in said isolating fillers . . . , said second trench being in the shape of a U,” as recited in claim 15. Therefore, claim 15 is allowable over Moriyama et al.

Moriyama et al. also fails to teach each and every element of claim 17, which recites a method of manufacturing a semiconductor device that includes, inter alia,

“making a plurality of first trenches . . . ; making element isolating regions by filling isolating fillers in said first trenches; making a side wall spacer on a surface of each of said isolating fillers in a side wall of said floating gate electrodes, said side wall spacer being in self-alignment to said floating gate electrodes; [and] making a plurality of second trenches in said isolating fillers filled in said first trenches using said side wall spacer as a mask, wherein said second trenches have a narrower width at a bottom thereof than at a top thereof, and a maximum width of said second trenches is smaller than a width of said first trenches.”

The Examiner considered Moriyama et al.'s element isolating regions (110) as corresponding to Applicants' claimed first trenches and isolating fillers, and alleged that Moriyama et al.'s spacer 111b “is on the surface of each of the isolating fillers (110) in a sidewall of the floating gate electrodes 104b.” Office Action, pages 4-5. However, as shown in Fig. 17 (l) of Moriyama et al., spacers 111b are not on the surface of elements 110 or in a sidewall of elements 104b. Rather, spacers 111b are on the surface of elements 104b and the sidewalls of element 111a. Therefore, Moriyama et al. fails to teach at least “making a side wall spacer on a surface of each of said isolating fillers in a side wall of said floating gate electrodes,” as recited in claim 17.

Moreover, to the extent the Examiner also considered the dent in element 110 shown in Fig. 17 (m) of Moriyama et al. as corresponding to Applicants' claimed second trenches (Office Action, page 5), Moriyama et al. does not disclose forming the dent using a side wall spacer on a surface of element 110 as a mask. Therefore, Moriyama et al. also fails to teach at least “making a plurality of second trenches in said isolating

fillers filled in said first trenches using said side wall spacer as a mask," as recited in claim 17.

Therefore, claim 17 is allowable over Moriyama et al.

Claim 20 depends from claim 17 and is also allowable over Moriyama et al. at least because of its dependence from an allowable claim.


In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims 4-5, 7-11, and 14-22.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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By:  _____
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* With limited recognition under 37 C.F.R. § 10.9(b).